Role of Leading People Plantation Commodities in Increasing Community Income and Environmental Preservation in River Areas Langsa District

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Abstract—**This research was conducted to examine the role of leading community plantation commodities in increasing community income and environmental preservation in the Langsa area, Langsa Regency. The research method uses descriptive analysis and location quotient (LQ), with secondary data from the 2008-2014-time series. Based on the results of the study, it is concluded that a) the leading smallholder plantation commodities in Langsa district consist of 3 (three) types of commodities, namely; commodities of rubber, coffee and candlenut, b) to develop superior community plantation commodities, the Government's role is needed in an effort to increase productivity specifically through various programs, c) the development of superior smallholder plantation commodities will have an impact on increasing community income in the Langsa River area in Langsa Regency d) apart from being a source of income for the community, this superior community plantation commodity plays an important role in the preservation of nature in the Langsa river area, Langsa district. Based on the research results it is suggested; a) Langsa Regency government, must increase productivity which is more focused on superior smallholder plantation commodities through various programs supported by improvements in farming technology and cultivation technology, infrastructure development, b) Langsa Regency government, must conduct various trainings for farmers who manage smallholder plantations , c) Langsa Regency government, must provide counseling to the community in order to increase community income in this area, d) Langsa Regency government, must support and direct the community in the framework of preserving the Langsa River area based on local wisdom.**

Keywords—income, business pattern, location quotient, river area

I. INTRODUCTION

The development of leading commodities which include plantation, horticulture and food crops in an area is a development process in the agricultural sector to spur regional economic growth. Agricultural development through the management of plantation commodities is one of the strategies that the government can implement in spurring economic growth through sustainable development. Stated that sustainable development is an effort to maximize the net benefits of economic development on the condition that it maintains and improves services, quality and quantity of natural resources at all times.

The Agricultural Research Service (USDA) defines sustainable agricultural development as agriculture that in the future can be competitive, productive, profitable, conserve natural resources, protect the environment and improve health and maintain food quality.

Sustainable agriculture is the management of natural resources with technology and institutions to ensure the fulfillment of human needs in a sustainable manner. Agricultural development must be able to conserve soil, water, plants and animals, not damage the environment, be economically viable. So that has implications for the environmentally sound development process, so that; 1) ensuring the fulfillment of community needs for present and future generations, 2) providing employment opportunities, 3) reducing the impact of agricultural development activities that cause environmental pollution, 4) producing a variety of high quality and competitive agricultural products. The development of the plantation sector that is being promoted by the government through the launching of a revitalization program for the development of superior plantation commodities such as rubber, oil palm, cocoa and other commodities that are in accordance with the potential and Eco geographic aspects of each region is one form of developing agriculture.

A leading commodity is a commodity capable of contributing to income for the region concerned. Each region has a different type of superior commodity [1]. Several criteria that can describe the superiority of a commodity in an area, namely; a) is widely known by the local community, is widely managed and developed, b) has a significant contribution to the

economy of the local community, can compete with other business commodities which are described by indicators of community income from the business, c) this commodity has compatibility in the agro ecological aspects especially regarding the location of the development, d) this commodity has the potential and market orientation, both domestic and export, e) has the support of government policies, especially market support and the availability of supporting factors such as; institutions, technology, capital, facilities and infrastructure as well as human resources [2].

Besides large plantations, smallholder plantations play an important role as a source of community income, employment opportunities, environmental conservation and biological resources. Smallholder plantation business is an activity carried out by small-scale farmers with traditional management with minimal technology. It is different from the plantation management that is managed by a government / private company, the management and exploitation system is carried out with the help of modern technology.

BPS data for 2018 show that the people's plantation area in Aceh Province reached 1,083,268.79 ha or nearly 55.55% of the total plantation area in Aceh with production reaching 6,889,228.39 tons. These people's plantations include; commodities of rubber, incense, coffee, chocolate, cloves, coconut, cinnamon, vanilla, hazelnut, areca nut, palm sugar, smallholder sugarcane to tobacco [3] means that these people's plantations have an important role as a source of community income, so that these people's plantations It is very potential to be developed. This can be seen from the contribution of land area and production that these smallholder plantations still contribute to community income and even regional income.

The development of the area and production of these people's plantation commodities has increased from year to year, for example in 2016, the rubber commodity has a land area of 8,279.76 ha, increasing to 8,332.25 ha in 2009. The production of this commodity in 2016 was recorded at 4,332.25 tons then increased to 4,661.84 tons in 2009 (up 0.04%) from the previous year, data by BPS Riau in 2019.

For Langsa Regency, there are several smallholder plantation commodities that play an important role as a source of community income including; rubber, coffee, chocolate, cloves, coconut, cinnamon, patchouli, hazelnut, areca nut, palm sugar, pepper and andaliman [3]. These commodities have various developments in land area, for example the community rubber commodity in 2006 with a land area of 655.97 ha has decreased to 442.00 ha in 2019. Likewise, the production of this commodity in 2006 was recorded at 707.74 tons and decreased to 584.80 tons in 2009 [3]. This shows that the people's plantations in Langsa are still very potential to be managed well, because the community in managing smallholder plantations generally still applies simple techniques with inefficient business management with traditional plantation management systems. For certain commodities, the seeds are obtained from well-cultivated plants without technology and a simple nursery process, so that

the productivity is low, the ability and resources of the farmers are still low. Based on the description above, this research was conducted to examine the role of sustainable agricultural development based on superior community plantation commodities as an effort to conserve the river area in Langsa Regency.

II. METHODS

This research was conducted through quantitative and qualitative descriptive approaches with a research design using a *Sequential Explanatory Strategy* design.

A. Place and Time

Research conducted in the District of Langsa Lama, Langsa City. The research period starts from July to September 2020.

B. Population and Sample

The population in this study were Cattel Aceh farmers in Langsa Lama District, Langsa City. The research sample consisted of 63 farmers. The technique of determining the sample using Non Probability sampling which is found by chance according to the criteria (accidental sampling) and is willing to be interviewed and fill out a questionnaire. Research design This research was conducted in River Langsa City, which was determined purposively by deliberately choosing the research location with special considerations this state by Kuncoro in 2009. The data used in this study are secondary data from 2016-2019 sourced from the Central Statistics Agency (BPS) Langsa, journals and other related official publications. This research uses descriptive analysis method and location question (LQ) method to determine the superior commodity of smallholder plantations in the research area by using the economic value of the smallholder plantation commodities studied as variables analyzed by referring to the following formulation Where:

NkiWa: The economic value of commodity i in an area of analysis

TnkWa: The total economic value of the commodity in the analysis area

NkiSn: The economic value of commodity i nationally

TnkiSn: The total economic value of the commodity national

The commodities analyzed are categorized into 3 (three) groups based on their LQ value (5), namely: a) if the LQ value> 1, then the level of commodity specialization is greater in the district compared to the same commodity in the province, b) if the LQ value <1, the level of specialization of the commodity in the district is smaller than the same commodity in the province, c) if the value of LQ = 1, then the level of specialization of a particular commodity in the district is the same as at the provincial level profitability (Y). The relationship between the dependent variable and the independent variable is depicted in Figure 1.
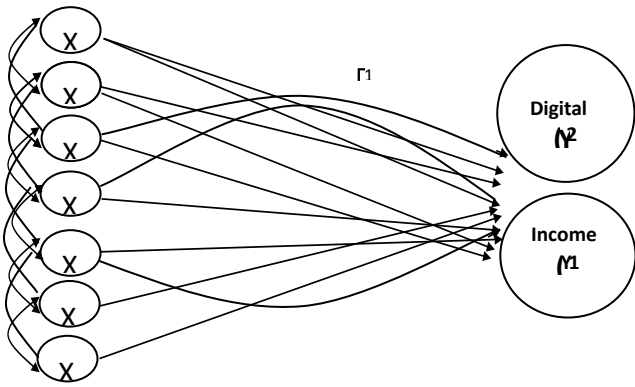
Fig. 1. Analysis of path.

Langsa City with an area of 2,021.8 km2 with a population of 175,325 people. One of the pillars of development in Langsa Regency is the creation of advanced agriculture so that it becomes a mainstay sector in driving the regional economy. The plantation sector, especially community plantations such as; rubber, incense, coffee, chocolate, cloves, coconut, cinnamon, patchouli, candlenut, areca nut, sugar palm, pepper and andaliman have an important role as a source of income for the community and even regional income for Langsa District [3]. This community plantation commodity is very potential to be developed in this area, it can be seen from the development of land area and production as shown in Table 1. Table 1. Potential Land Area and Production of Smallholder Plantation Commodities in Langsa District 2016-2019

Based on the results of data analysis as in Table 1, it can be seen that the community plantation commodities in Langsa Regency are very potential to be developed in order to increase community income and environmental preservation. The data shows that the land area for the coffee commodity has experienced very significant growth from 2008 to 2014 which is followed by the development of production, this shows that the area of land for the coffee commodity managed by the community in this area has increased and of course this land expansion will have an impact on increasing community income and for environmental preservation in the region. The development of land area for the coffee commodity managed by the community in Langsa Regency in 2008– 2014 is presented in figure 2.
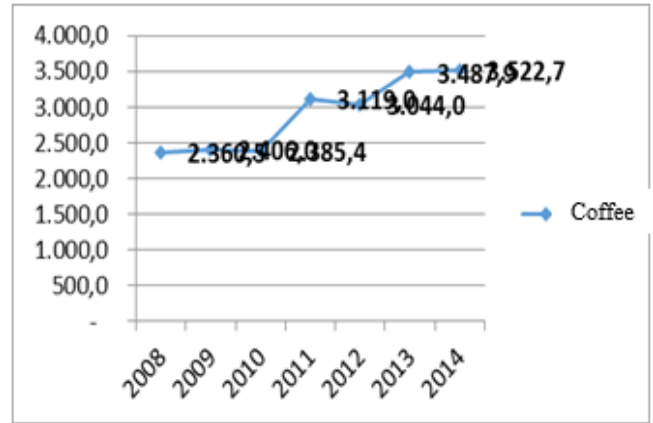

Fig. 2. Development of smallholder coffee plantation commodities in Langsa 2016-2020.

Besides the coffee commodity, there are other plantation commodities that have the potential to be developed in this area as presented in Table 1, namely the rubber commodity with an area of land that has experienced significant and linear development from 2016 to 2020. The development of this land area is followed by the development of production so that it has an impact on people's income. Likewise, several other commodities have also experienced significant land area developments from 2016 to 2020. The development of land area for community plantation commodities will have an impact on environmental conservation efforts in this area as shown in figure 3.
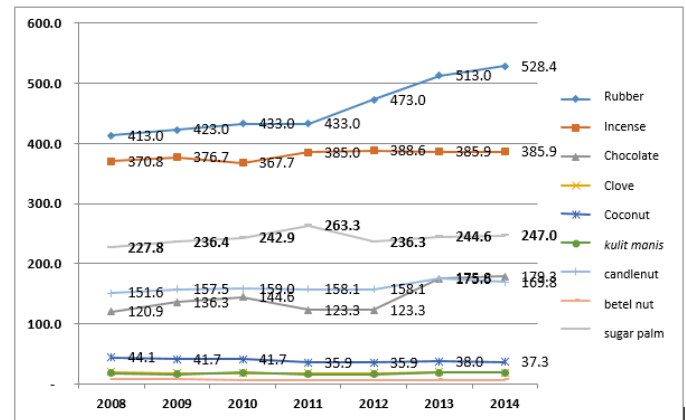

Fig. 3. Plantation of commodities.

Figure 3, development of smallholder plantation commodities in Langsa Regency 2016-2020.

III. RESULTS AND DISCUSSION

A. Leading People's Plantation Commodities in Langsa Regency

Based on the results of data analysis using the LQ analysis method, it is known that several types of superior smallholder plantation commodities in Langsa Regency are as shown in

No	Komoditi	Luas Perkebunan Rakyat (ha)							Produksi (ton)						
		2008	2009	2010	2011	2012	2013	2014	2008	2009	2010	2011	2012	2013	2014
1	Karet	413,0	423,0	433,0	433,0	473,0	513,0	528,4	510,0	510,1	480,8	315,0	520,7	560,0	561,2
2	Kemenyan	370,8	376,7	367,7	385,0	388,6	385,9	385,9	54,1	54,0	52,7	53,0	55,0	57,1	57,2
3	Kopi	2.360,5	2.406,0	2.385,4	3.119,0	3.044,0	3.487,9	3.522,7	3.349,1	3.349,1	2.828,7	2.611,7	2.986,1	3.360,5	3.390,1
4	Coklat	120,9	136,3	144,6	123,3	123,3	175,8	179,3	67,7	46,1	61,8	34,1	36,8	4,3	38,5
5	Cengkeh	20,4	18,1	18,1	18,3	18,3	19,9	19,5	3,8	3,7	3,5	4,0	3,2	4,3	4,3
6	Kelapa	44,1	41,7	41,7	35,9	35,9	38,0	37,3	37,1	38,0	34,0	15,1	17,0	16,6	16,6
7	Kulit Manis	18,7	16,5	18,9	16,5	16,5	19,2	18,9	5,5	5,1	7,0	5,7	5,9	5,9	5,9
8	Kemiri	151,6	157,5	159,0	158,1	158,1	175,6	169,8	574,3	497,5	281,8	99,5	100,3	99,6	103,3
9	Pinang	7,7	7,7	6,4	6,4	6,4	6,7	6,7	8,7	8,7	6,0	6,4	1,9	1,9	2,6
10	Aren	227,8	236,4	242,9	263,3	236,3	244,6	247,0	44,4	42,0	37,8	44,9	42,9	43,1	43,2

Table LQ Value of Smallholder Plantation Commodities in Langsa Regency 2016-2020

Based on the results of data analysis using the LQ method as in Table 2, it is known that the rubber commodity as one of the smallholder plantation commodities in this area has a consistent LQ> 1 value from 2016-2019, this shows that this commodity has a greater level of specialization in Langsa Regency. Compared to Riau, this means that this commodity is a superior commodity of smallholder plantations in Langsa Regency. Besides the rubber commodity, there is a coffee commodity that has a value of LQ> 1 consistently from 2016-2020, with an LQ value of> 1, this shows that this coffee commodity also has a greater level of specialization in Langsa Regency compared to Riau, so this commodity is superior commodity of smallholder plantation in this region. Then based on the results of data processing as in Table 2, it is known that the candlenut commodity also has an LQ value> 1 consecutively since 2008-2014, so this commodity has a greater level of specialization in Langsa compared to North Sumatra, meaning that this commodity is a leading smallholder plantation commodity in Langsa Regency [4] and the development of the LQ value of these three commodities as presented in figure 4.
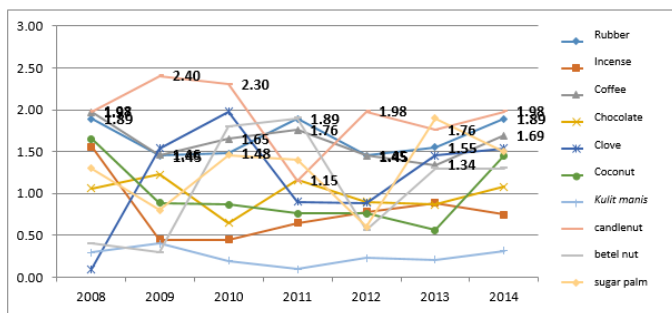

Fig. 4. Graph of development of LQ value for leading commodities for smallholders in Langsa Regency 2016-2020.

B. Development of Leading Community Plantation Commodities to Increase Community Income

Based on the results of data analysis as in Table 2, it is known that in Langsa Regency there are 3 (three) types of superior smallholder plantation commodities, namely; For the commodities of rubber, coffee and candlenut, the Langsa Regency government must make efforts to increase its productivity specifically through various productivity-enhancing programs that are appropriate to increase people's income. The rubber commodity as a leading commodity in Langsa Regency has the potential to be developed to increase people's income. This commodity is also an industrial forest plant that is economically profitable because it produces latex and wood so that it increases land productivity, benefits social development and increases community income [5].

The results of the research by Boerhendhy and Agustina [6] stated that the economic value of rubber plants lies in their ability to produce latex. After the age of 4-5 years, rubber

plants can be tapped. With good tapping techniques, rubber plants can be tapped for 25-30 years (Junaidi et al. in Boerhendhy and Agustina [6]). If it is assumed that the production of sleb farmers per month in the first year of tapping reaches 80 kg / ha and the price level in farmers is IDR 10,000 / kg, then the income per month from rubber products will reach IDR 800,000 / ha and this sleb production will continue to increase as it increases age of the rubber plant. Boerhendhy and Agustina [7] state that net income from selling rubber wood during rejuvenation can reach IDR 3,869,700 / ha.

Boer hendhy and Agustina [6] stated that rubber seeds as a by-product can be used as animal feed and the paint industry, apart from being a source of seeds for rootstocks. The number of seeds produced from one hectare of rubber per year is between 337,000-451,000 or an average of 394,000. If it is assumed that the price of rubber seeds is Rp. 80 / grain, the farmers will get an added value from the sale of rubber seeds of Rp. 31,520,000 in one seed season period. Rubber leaves can also be processed into handicraft materials, so that all parts of the rubber plant can be used to increase farmers' income. In addition to the community rubber plantation commodity, Langsa Regency coffee also has candlenut as a leading community plantation commodity which has the potential to be developed as a source of income for the community in Langsa Regency. The results of research by Kadir et al. [8] stated that 58.9% of the community developed candlenut plants in the Langsa City Park area. Candlenut plants in this region have been developed since the Dutch Government and since then candlenut is a symbol of social status and a source of community income. Furthermore, Kadir et al. [8] conveyed that the average income of the community reached Rp. 8,836,376 per year. So that the Langsa Regency Government must play a role in helping the community to develop these superior community plantation commodities, including in providing land in order to increase its production.

Land is a dependent place to meet the living needs of farmers and their families Arianti et al. [9] and Arsyad [10] convey that land use is defined as a form of intervention on land in order to meet the living needs of farmers through increasing agricultural production.

In line with that, Friyatno [11] states that the key to success in increasing the productivity of superior crop commodities must be supported by several factors, namely; a) improvement in farming technology, b) the need for infrastructure development such as; irrigation, extension agencies and so on. Kadir et al. [8] stated that extension is a process of transferring knowledge and technology which aims to improve the community's capacity, especially regarding good farming techniques to increase the productivity of cultivated land by farmers. In line with that, the Langsa Regency government must make an integrated effort in order to increase the productivity of the people's plantation commodities by providing affordable production facilities, improving cultivation and post-harvest technology and conducting various trainings for farmers in managing smallholder plantations in this area, so that the level of community income is managing

community plantation commodities has improved. 3.4. Development of Prominent Community Plantation Commodities in Preserving the River Area

In accordance with the results of data analysis as in Table 2, there are 3 (three) types of leading smallholder plantation commodities in Langsa Regency, namely; commodity of rubber, coffee and candlenut. Rubber as a smallholder plantation commodity, is one of the plantation commodities that plays an important role in reforestation and land rehabilitation, because of its adaptability to the environment [12]. Boerhendhy and Agustina [6] convey that rubber plants have a fairly good ability in creating a stable environment, making it suitable for replacing productive wet tropical forest vegetation, and can be cultivated with minimum tillage (minimum land clearing or minimum tillage).

According to Azwar et al in Boerhendhy and Agustina [6] energy produced by rubber plants, in the form of oxygen and biomass, can be used to support environmental improvement functions such as land rehabilitation, preventing erosion and flooding and creating a healthy climate. Naturally, the rubber plant experiences leaf falls every year which can fertilize the soil. This life cycle will continue to repeat itself during one rubber crop cycle, for at least 30 years. Rubber plants in one cycle can tie up CO2 in the air an average of 23 tons / ha / year. CO2 can be converted into organic forms that make up plant tissues such as roots, stems, leaves, seeds, and latex [13].

Jariyah [14] stated that soil conservation can be done technically and vegetative. Vegetative soil conservation can be done by developing industrial plantation forests, which are useful for increasing soil productivity and water quality. The use of rubber plants for the development of industrial forest plantations was studied in 1989. In this study, use rubber as an industrial forest plant in terms of ecological compatibility, which can create a healthy environment because rubber plants function as a source of oxygen, regulator of groundwater management, prevention of erosion and formation. humus, so that it will increase land productivity [5].

If viewed from the viewpoint of vegetation, rubber smallholder plantations can act as rubber forests, because they will function as erosion and landslide prevention as well as a source of flora. The high adaptability and genetic diversity of rubber have made it possible to develop in marginal and critical lands in the Batang Lubuh area in Langsa Regency, considering that this commodity is a leading smallholder plantation commodity and is capable of producing increased productivity from 1.08 tons / ha in 2006 to 1 32 tonnes / ha in 2009 and 1.1 tonnes in 2014 [3].

In addition to the rubber commodity, there is coffee commodity as a leading community plantation commodity in Langsa with an area of 2,385.43 ha in 2009 and a production of 3,064.84 with a productivity of 1.28 tonnes / ha in 2014, the land area for this commodity was recorded 3,522.7 ha with a production of 3,390.1 tonnes. with a productivity of 0.96 tonnes / ha [3], it is very potential to be developed as a source of community income and preserve nature. The development of

leading community plantation commodities in the Langsa area is a form of conservation farming [14]. Conservation farming carried out by the community in this area is needed to support the success of forest area development. Saragih in Jariyah [14] states that conservation farming is basically a package of farming technology which aims to increase farmers' production and income and conserve land resources.

Agus, et al. [15] stated that coffee plantations located in protected forest areas in Sumberjaya, have an important role in maintaining natural ecosystems and are able to conserve soil well. With a monoculture system of smallholder plantations in the event of heavy rains, the coffee canopy and roots function to protect the land. When the coffee plant gets bigger, the soil protection function gets better so that the soil erosion rate decreases. In addition to rubber and coffee commodities, candlenut as a leading community plantation commodity has the potential to be developed in the context of environmental conservation in the Batang Lubuh River area. Yusran [16] states that in the Bulusaraung Mountains area of Maros Regency, the candlenut forest is very strategic in preserving nature which is carried out through the preservation of the candlenut forest itself by means of; a) develop agroforestry patterns to increase land productivity and product diversification, b) strengthen farmer institutions and capacities in the marketing system. This concept is suitable to be applied in Langsa district [5] considering that in 2014 the land area for this commodity reached 169.8 ha with production reaching 103 tons and this commodity leading commodity in the region, the data by BPS Rohul in 2019.

Boerhendhy and Agustina [6] convey that annual plant farming is a permanent land use model by optimally utilizing land according to the agro-climatic conditions and culture of the local community. The advantage of annual plants as the main crop in the watershed area is that cultivation can apply minimal tillage so as to prevent the physical structure of the soil. Thus, the Langsa district government must play an important role in helping the community to develop these superior community plantation commodities, including providing land in order to increase land area as well as conducting education, training and counseling so that the ability of farmers increases. Mosher in Kadir, et al [8] stated that the level of education affects the way a person thinks, especially in analyzing a problem. A well-educated person will easily adopt new technology and develop skills and solve problems, even if the tendency is that if a person's education level is higher, it will be more responsive to change. Arianti, et al. [9] also stated that the level of education has an effect on a person's behavior in facing the environment, both the physical environment and the social environment. The level of education is assumed to have an effect on a person's way of thinking where the higher the education, the more knowledge will be reflected in actions including knowledge about environmental conservation.

IV. CONCLUSION

Based on the results of the analysis, it can be concluded that a) the leading smallholder plantation commodities in Langsa district consist of 3 (three) types of commodities, namely; commodities of rubber, coffee and candlenut, b) to develop superior community plantation commodities, the Government's role is needed in an effort to increase productivity specifically through various programs, c) the development of superior community plantation commodities will have an impact on increasing community income in the Batang Lubuh river area in Langsa Regency, d) apart from being a source of income for the community, this superior community plantation commodity plays an important role in preserving nature in the Batang Lubuh area, Langsa district

V. SUGGESTION

In accordance with the research results it is suggested; a) Langsa Regency government must make efforts to increase productivity that are more focused on superior smallholder plantation commodities through sharing programs, such as intensification and extensification of smallholder plantations supported by improvements in farming technology and cultivation technology, infrastructure development, and provision of production facilities, b) District government Langsa must conduct various trainings for farmers who manage smallholder plantations, c) Langsa Regency government must provide counseling to the community in order to increase community income in this area, d) Langsa Regency government must support and direct the community in the framework of preserving the Batnag Lubuh River area on a basis local culture.

ACKNOWLEDGMENT

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